Notice of Allowability	Application No.	Applicant(s)	
	10/802,064	SAR ET AL.	
	Examiner	Art Unit	
	/John Pettitt/	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *04/19/2007*.

2. ☒ The allowed claim(s) is/are *8-10,20-22,26,27 and 29*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

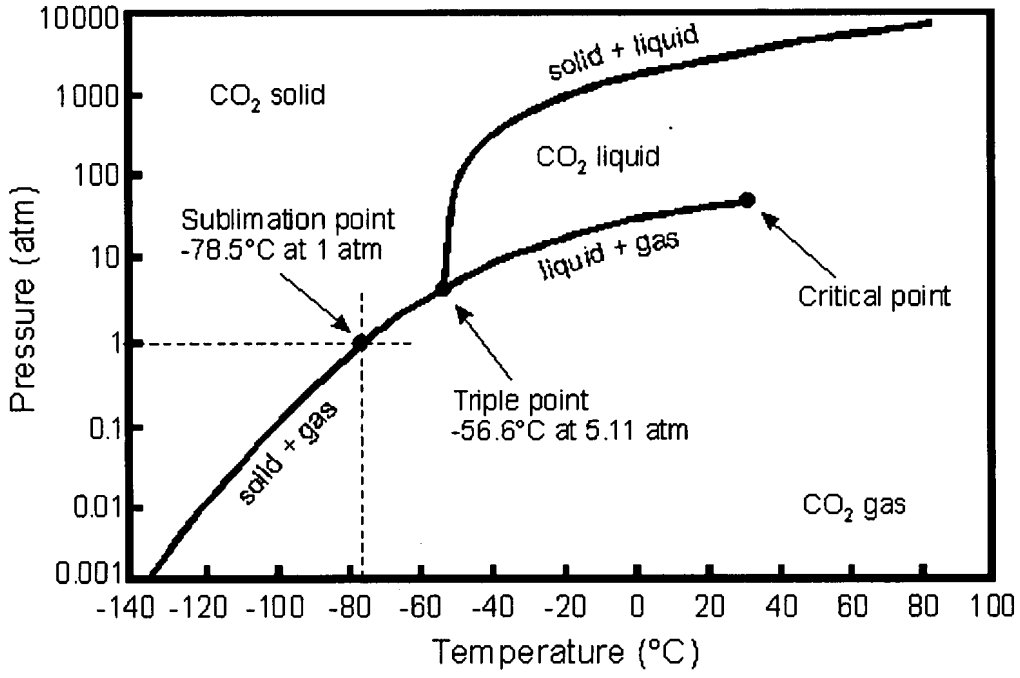
DETAILED ACTION

Reasons for Allowance

Krause teaches a method comprising: evacuating a chamber having a substantially-pure gas therein (column 2, lines 70-71); freezing residual gas in the chamber to generate a high-level vacuum within the chamber (column 3, lines 45-50); purging impurities from the chamber with the gas by filling the chamber with the gas (column 2, line 71); repeating the filling and the evacuating to reduce impurities from the chamber and to obtain a high concentration of the gas within the chamber (column 4, lines 8-11); and after filling the chamber with the gas, evacuating the chamber prior to freezing to generate a medium-level vacuum (column 3, lines 4-5, 42-45).

Krause does not explicitly state that carbon dioxide can be used as the substantially-pure gas nor that the pure gas should have an impurity level of less than 100 PPM. Gases commonly employed in a laboratory environment such as taught by Krause (i.e. plasma physics research) are generally "ultra-high" purity gases which have a purity of 99.999% (as taught by Moriya - column 1, lines 18-20). Since this means that there are 0.001% impurities remaining; this is equivalent to 1 impurity per 100,000 or 10 PPM which is less than the claimed 100 PPM. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to employ a gas having an impurity level of less than 100 PPM for the purpose of generating a high purity plasma (Krause - column 1, line 23) for the purpose of obtaining better quality experimental results from the tests performed (i.e. more predictable and having less error).

The properties of carbon dioxide are inherent qualities, therefore the claimed limitation that the carbon dioxide have a freezing point that is above about 100 K at the medium level pressure is not a limitation restricting the behavior of the gas (since this is inherent to carbon dioxide) but limits the scope of the medium pressure. Therefore, the medium pressure of the method must be such that the gas freezes at a temperature above 100 K. As seen in the phase diagram below, at any of the vacuum levels shown, carbon dioxide freezes at a temperature above 100 K (-140 C is equivalent to 133.15 K).



Pressure-Temperature phase diagram for CO_2.

Krause teaches that the gas employed can be any material that is a gas at room temperature and is solidifiable (column 4, lines 17-20). However, one of ordinary skill in the art would not choose to employ carbon dioxide in the system of Krause, because the system and method of Krause requires that the medium vacuum pressure be chosen such that the gas becomes a liquid (column 3, lines 11-15). As can be seen from the phase diagram, carbon dioxide does not become a liquid at vacuum pressures but is either a solid or a gas. Therefore, one of ordinary skill in the art, at the time the invention was made would not choose to modify Krause by using carbon dioxide for the pure gas.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to /John Pettitt/ whose telephone number is 571-272-0771. The examiner can normally be reached on M-F 8a-4p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John Pettitt/
Examiner
Art Unit 3744

JFP III
June 21, 2007

CHERYL TYLER
SUPERVISORY PATENT EXAMINER